

The meaning of concrete for interwar Nottingham: geography, economy & politics

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Abstract

What did concrete mean to the city of Nottingham during the 1920s & 30s? How did the city respond to the formative years of this material in terms of geography, economy and politics? On the one hand this was a city that momentarily saw concrete as the vanguard of pragmatic modernism and economic diversification alongside a utilitarian approach to social reform. And on the other, a city more willing to fall back on established materials and structures.

Concrete was very rarely a monstrosity for interwar Nottingham: it more often meant economic revitalisation, technological change, social improvement, cleanliness, efficiency, fashion and comfort. As a product of the landscape, the city made an important contribution to the formative years of this twentieth century material. In a climate of recession after the First World War, concrete represented a hope for the future that was readily expressed by the most innovative of the city's commercial firms. Yet compared to the city's commercial concrete achievements, the approach from local government appeared tame: here a delicate balance had to be played out between the power of conservative symbolism and the efficiency of social improvement.

Keywords

Nottingham, interwar, architecture, planning, concrete, Sir Owen Williams.

Introduction

The English East Midlands may be a difficult region to define but its cities have certainly been successful at defining themselves through local and urban history.¹ Its principal city, Nottingham, has both ample primary source records and more importantly a key role within concrete architectural history.² The following primary source material can be assessed: local authority planning records, minute meetings, local newspapers and photography.³ This material limits our scope: when discussing 'the city' we are really talking about Nottingham's local government, industries and newspapers. Given the remit of this paper, the analysis is further refined by imposing a historical timeframe, the interwar period, when concrete became a mainstream material. The concrete architectural developments of this era are wide ranging, from the highly lauded Boots D10 by Sir Owen Williams to smaller commercial buildings and as an important component of public infrastructure. It is of course outside the remit of this paper to offer a full survey – though Elain Harwood's *Pevsner City Guide* is certainly helpful – but by focusing on the main developments we can draw some strong conclusions.⁴

The methodology of this study has been influenced by Adrian Forty's *Concrete & Culture*,⁵ which has widened architectural discourse with an inclusive approach to contrasting primary source accounts. Unlike Forty's book however, this paper has a much smaller focus and so the religious buildings, memorials, photographs and architectural debates are not enough to warrant a separate analysis. Instead this local approach will coalesce Forty's themes and will expand current international debates about the regional circumstances of concrete.⁶ Furthermore, many of Nottingham's concrete buildings have yet to be considered by historians and so this paper also broadens the architectural perspective.⁷ With this in mind this study will assess the Nottingham reception of concrete in three areas: Firstly to consider the geographical aspect of a concrete industry dependent on the geology of this city and its region – how did these local firms operate and develop? This brings to our second aspect, the city's economy: why and how did certain businesses commission buildings using this material? And thirdly, what was the local government role and what did they set in concrete? All of these questions will be accompanied by an analysis of the discussion and reception of concrete in order to ascertain what the material meant to the city.

This paper will suggest that the meaning of concrete for Nottingham during the interwar period was much different to the popular opinions by the close of that century. Firstly, the geography of the city and its region influenced its development, largely underpinned by the expansion of Trent Valley concrete and aggregates. This was an important local material and industry, although without the same strength in identity as the city's more established enterprises. When it came to organisations such as Boots and William Hollins & Co, concrete was clearly lauded for its commercial efficiency and embodying the futuristic. Despite this, other large companies such as Raleigh Cycles and Home Brewery were much more hesitant. And finally, concrete engendered huge political considerations, in terms of slum clearance and housing. Here it was an improver in everyday utilities and though the technology was desired it wasn't always visible. The meaning of concrete for interwar Nottingham is therefore complex: on the one hand a city that sees concrete as the vanguard of pragmatic modernism and economic diversification alongside a utilitarian approach to social reform. And on the other, a city more willing to fall back on established materials and structures.

1. Geography

Defining our chosen field of study is not without ambiguity, yet thankfully historical studies have shown that by the twentieth century both the discourse and economic activity centred on Nottingham had a rough ten-mile radius from the city centre.⁸ It was this area where not only was the demand for concrete centred, but also where it was produced. Concrete manufacture within Nottingham during the early twentieth century was a product of its very landscape, the bulk of which is defined by two contrasting geological regions: a raised central sandstone watershed characterised by woodlands, and a lowland expanse of clay which gives way to the River Trent.⁹ Supplies of sand and gravel – those key ingredients within the chemistry of concrete – were therefore abundant, and this was especially so within the Trent Valley at Nottingham. Here the River Trent, the third longest river in England, has over the millennia left huge 'drift' deposits of sand and gravel, both along the floor of the valley and upon various river terraces.¹⁰ In 1900 the quarrying of Trent Valley sand and gravel was a by-product of estate and river management but by the close of the twentieth century with an output of 50 million tons this region competed directly with the Thames Valley as the largest producer of aggregate materials in England.¹¹ The reason for this enormous growth was principally tied to the demand for concrete, which grew quickly amid the interwar period but escalated at dramatic speed during WWII and throughout the postwar construction boom. This material, as Adrian Forty states, has often been inaccurately defined by its lack of regional distinction,¹² as compared to stone or brick, or as an arbiter of the 'international style'. Yet a closer inspection reveals that there are regional characteristics of concrete and these can be defined by the type of sand and gravel used: Thames Valley gravels are composed mainly of flint and chalk from the surrounding uplands of the South East of England, whereas the Trent Valley contains a higher proportion of quartzite pebbles from the sandstone of the North Midlands.¹³ These distinctions have often remained too subtle for architectural discourse to evaluate the separate peculiarities of English concrete, but what has defined Trent concrete more precisely from the Thames are the enterprises which developed independent from it, particularly those in quarrying, manufacture, distribution and construction.

In terms of gravel quarrying and concrete manufacture at Nottingham there were three main companies that developed in the years immediately after the First World War: Hilton Gravels (Shardlow), Trent Gravels (Attenborough) and Trent Concrete (Colwick).¹⁴ Another large concern, Hoveringham Gravels, was established in 1939,¹⁵ clearly attracted to the area by the commercial success of its Trent Valley predecessors. All of these

companies continued to grow rapidly in the later half of the century and despite various take-overs, amalgamations and closures, there are still quarries or concrete works at the same locations. Trent Concrete began advertising for machines and employers in the local press in 1918, and four years later was considered the largest gravel treatment plant in the country producing 60 tons per hour and using the latest technology in gyratory crushers imported from the USA.¹⁶ The site also produced cast concrete products such as balustrades, garden furniture, gateposts and tracery windows. Much of this was housed in a tall structure positioned immediately beside a riverside dock,¹⁷ both of which were built almost entirely out of concrete and give the impression of those industrial American concrete buildings (such as those by Albert Kahn or Cass Gilbert), which were so admired by Walter Gropius.¹⁸ The other two companies, Trent Gravels and Hilton Gravels, were not as enterprising in their own concrete constructions and appeared to be more focused on the material supply, rather than the setting and form of concrete. Trent Gravels began operating in 1929 and within ten years it was producing 75 tons of gravel per hour and was one of only four suppliers of ready-mix concrete in the country. Hilton produced 'Hilcrete' precast concrete products for the local agricultural market from 1924, but its real strength lay in the sheer scale of its gravel pits; quarried primarily for the footpaths and drives market.

The realisation of the potential gravel reserves within the Trent Valley was born out of river dredging by the Trent Navigation Company,¹⁹ an inland water distribution firm who were also responsible for the upkeep of the waterways around Nottingham. Gravel sales in 1931 accounted for nearly half their annual revenue.²⁰ During the interwar period this private organisation experienced a brief spell of public investment while under the management of the Corporation of Nottingham. This successful period was constructed almost entirely out of concrete, which is hardly surprising given that the Chairman of Directors, Ernest Jardine, also had a hand in establishing the Trent Concrete company. The first significant construction, complete in 1919, was a six-storey warehouse within the city's traditional distribution area adjacent to a narrow barge canal.²¹ Though the vast majority of the building is in red brick, Georgian classical style with bays divided by pilasters, it stands over a large concrete basement and overall the building is visually similar to the Navigation's later fully concrete warehouses. This is where the form of Trent-side concrete evolved from and though a popular listed structure today it received little press at the time. Debate during its construction was focused on the next major problem for the company - the inefficient waterway between Nottingham and Newark.²²



Figure 1. Stoke Bardolph Lock and T. C. Howitt's Lock Keeper's 'Cottage', 1923 (courtesy of Nottingham City Council and www.picturethepast.org.uk).

The improvement works on the River Trent carried out throughout the 1920s was a regular local news story, framed in terms of tackling unemployment and economic revitalisation. Dignitaries such as Thomas James

Macnamara (Minister of Labour) were often attending the works at Holme Lock, Stoke Badolph Lock, Gunthorpe Lock, Hazelford Lock and Nether Lock.²³ In 1926 it was reported that the Minister of Health Neville Chamberlain formally opened the new Trent Navigation scheme, under the headline 'Nottingham a Port' with the following story adding that this 'long cherished hope' had at last been realised. It was Chamberlain who only four years previously as Chairman of the National Inland Waterways Committee described the scheme as 'the greatest step in inland waterway transit since the opening of the Manchester Ship Canal ... of national as well as local importance', and as, 'a symbol for the whole country'.²⁴ Such headlines had already been accompanied by the approval of the Notts & Derbys Traders Association; this was an all-round positive news story for the city and though it was set in concrete the material was rarely mentioned. The Corporation published a celebratory book in 1926 called 'Highway to the Sea',²⁵ featuring photographs of the major works. The five locks are a noticeable feature within the Trent Valley landscape, big enough to accommodate 100-ton barges, including a weir and space for mooring. All of this is a thoroughly utilitarian concrete construction that at certain points – such as the curved abutments – has a proto-Brutalist appearance. Yet there was clearly no intended style, indeed this proto-Brutalism was not continued when it came to the lock keepers' cottages (Figure 1), which were built of brick and designed in the garden city style by prominent Nottingham architect T. C. Howitt.²⁶ Concrete was clearly considered as infrastructural and industrial rather than residential and homely.

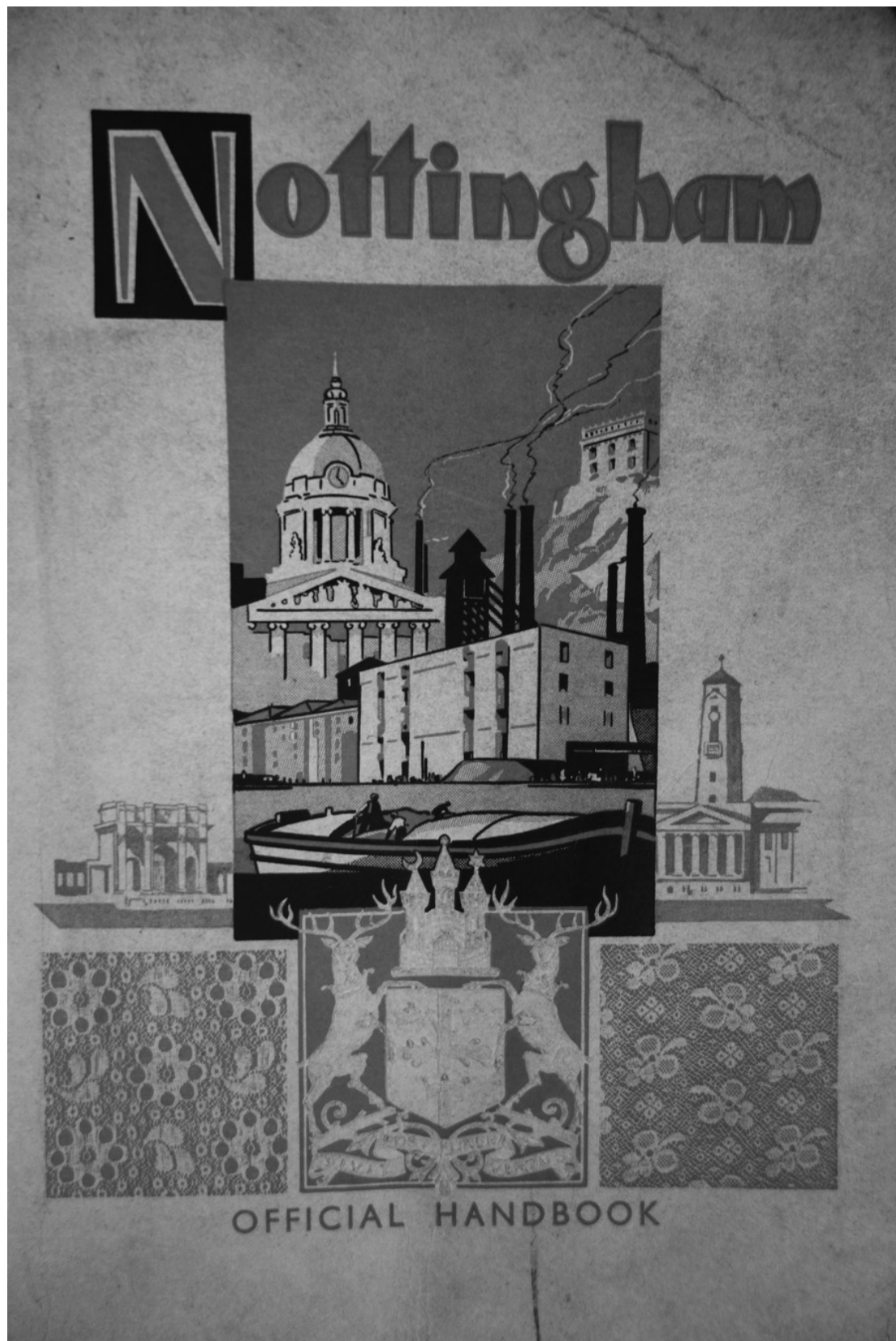


Figure 2. Trent Lane Depot positioned firmly at the centre of the 1935 City Handbook (92.52, The City of Nottingham Official Handbook [Nottingham, Nottingham Corporation, 1937]; courtesy of Nottinghamshire County Council: Nottinghamshire Archives).

Operating from 1928, the most significant concrete structure commissioned on behalf of the navigation improvement scheme was undoubtedly Trent Lane Depot at Nottingham – a mile upstream from Colwick Industrial Estate. This was essentially two warehouses with a combined floor space of 76,500 square feet, a basin

and river wall mooring, all sandwiched between the Trent and a railway sidings.²⁷ Cargo could be discharged direct to railway truck, boat or lorry, using electric hoists and spiral shoots – these shoots featuring on the front page of a local newspaper with dignitaries in attendance.²⁸ It was proudly seen by the city's government and press as proof that Nottingham was now a major inland port. The depot was a regular news story in the local press, and given a strong graphic depiction at the very centre of the 1935 Corporation Handbook (Figure 2) – an annual civic and trade publication advertising the city's assets. Within its pages there is large write-up of its technical specifications, including two photographs of the site and detailed plans of the network and location. It was claimed that there was room for 34 barges to directly discharge and the reinforced concrete was 'unsurpassed by any in the country'. A calculation of annual increases of tonnage carried on the Trent since 1926 affirmed its success: an increase from 29,000 to 284,666 tons by 1932. In 1939 the newspapers were reporting a dip on the previous year of 9,000 tons, but despite the occasional fluctuation annual trade had more than doubled in seven years to 607,864 tons per annum.²⁹ Most of the trade was traveling upstream between Hull and Nottingham, the bulk of which included oil, sand, gravel, 'dredged materials', timber, grain and cocoa for Messrs Cadbury & Fry of Bournville.³⁰ Formally, the Trent Lane Depot clearly combines the developments of its predecessors: the American utilitarian style shown earlier at Trent Concrete at Colwick and the classical proportions of the 1919 Trent Navigation warehouse. The technical drawings seem to affirm this view but early photographs of the completed structure suggest a slight modernist leaning with white painted concrete and its functions – hoists, canopies, doors, typography – in a clearly contrasting tone.³¹

Geographically it seems concrete meant economic revitalisation hewn from the very landscape: local self-sufficiency and confidence at a time of economic uncertainty in British industry. If at first the concrete forms were tentative they quickly developed in confidence and created significant achievements. There were regional characteristics, similarities with American structures, tentative modernist styles and an infrastructural proto-Brutalism. The most symbolic structure was Nottingham's 'Highway to the Sea' – a major inland waterway, which was highly lauded by national politicians and a source of pride for local government. This was not only embanked by concrete but the dredging of which highlighted the city's reserves in sand and gravel. Subsequently enterprising firms such as Trent Gravels and Trent Concrete flocked to the banks of the river and firmly establish themselves among the biggest producers of concrete in Britain. The activities of Colwick Estates Ltd and Ernest Jardine show that concrete represented a desperate need to diversify and build a new industrial system. How successful that was would partly depend on the response from the city's business and civic leaders.

2. Economy

Local newspapers offer a key source for observing developments in architectural discourse and at the centre of their dynamic was always the tension between commerce and social responsibility.³² The local press in Nottingham had a vested interest in the commercial activity and economic growth of the city, especially as their revenue was based on advertising and sales. By the interwar period provincial newspaper numbers were in decline, large national dailies increased their circulation,³³ and these circumstances were having their effect on Nottingham where a monopoly in local news was beginning to take shape.³⁴ The Nottingham Evening Post and Nottingham Guardian, both under the proprietorship of the Forman family, were becoming the most dominant players in current affairs news. Historically Forman newspapers were Conservative protectionist but by the interwar period their political leanings had been liberalised by commercial pressures. Nevertheless, at heart, this was a contemporary conservative newspaper, though one tied to the industrial activity of the city and reinforcing Nottingham's sense of identity as a place of manufacture.

Beyond the odd article in the trade journals, Nottingham's concrete manufacturing companies experienced only occasional commentary within the local press. Trent Concrete was perhaps the most talked about but mainly due to the firm's football team, which gives some indication of the strength of staff morale and identity.³⁵ Football aside, the company was spoken about in generally positive and excitable terms, especially when it was associated with the activities of its location at Colwick Estates Ltd. Both the estate and a number of the companies within it – such as Trent Concrete – were initiated by the successful lace industrialist Ernest Jardine. As someone responsible for manufacturing lace machines for export, he was more than aware of the city's perilous position if it were to rely solely on the lace trade.³⁶ The 'Developing the Colwick Site' story reached local front page news in 1922.³⁷ Trent Concrete was described as an 'important firm', alongside three other companies, one of whom The Midland Coal Product Company had a factory constructed in the Hennebique system of reinforced concrete. Not only was the Colwick estate famed for its concrete road and industries, but was discussed in a wider context of 'new industry' fighting off a recession and therefore a good thing for the city. Six years later during a Royal Agricultural Society show at Wollaton Park a Trent Concrete trade display took pride of place. Described in the Nottingham Evening Post as 'a class of its own', 'handsome and artistic structure' showcasing a 'concrete municipal shelter and silo for grain'.³⁸ Only a few months before the Colwick Estates development plan had been illustrated in the same newspaper – it seems the local press had its hopes for economic prosperity pinned on Colwick, concrete and the Trent.³⁹

By the interwar period Nottingham's lace industry had begun to falter and there was a concerted effort to diversify the economy.⁴⁰ Fortunately for the city that process was already underway in the later half of the nineteenth century with its successful developments in commercial manufacture: most notably pharmaceuticals, cigarettes and bicycles. Many of these products were aimed at working class consumers, especially Boots, which like Woolworths would experience a period of growing demand in the 1920s and 30s. By this time, Boots' in-house publications such as *The Beacon* and *Bee* were strewn with articles on the firm's great tradition and history.

Since the 1860s Boots had grown from a small local concern into the largest retail chemist in the country with over 600 shops and 13,000 staff nationwide by the 1920s. Primarily driven by the autocratic Jesse Boot, his liberal paternalism was endeared throughout the city, yet by 1920 Boots appeared vulnerable and disorganised: Jesse was now an invalid and unable to keep a close eye on his huge business. With bankruptcy possible, Boots was sold to the American United Drugs Company, injecting Boots with new ideas about territorial management and manufacturing.⁴¹



Figure 3. D10 interior packing hall, c.1930s (CAIS 6531; courtesy of The Alliance Boots Archive and Museum Collection).

This change in management structure undoubtedly contributed to the firm's interwar success and the appointment of Sir Own Williams.⁴² With his direct experience of American reinforced concrete at the Trussed Concrete Steel Company, Williams was the ideal candidate for the new progressive Boots.⁴³ He was also able to embody both aspects of the company's psyche, as both an innovator and man of the establishment. Williams wasn't appreciated for continental style theorising, but rather his practical engineering achievements for the British Empire Exhibition, the Dorchester Hotel and the Daily Express. In 1928 Boots embarked on the construction of a huge industrial estate, an idea that was not possible before the age of buses and bicycles.⁴⁴ This fresh start gave the company room to completely re-think its manufacturing process along the most efficient and modern lines: at the close of the 1930s they had started making Aspirin, Flavines, Bismuth Salts, Chloroform and Iodides. In 1934, the head of the company, Lord Trent, makes clear that Boots had caught up with the second industrial revolution:

'The work of the manufacturing chemist has made great strides in this country in the past 20 years. Before the [First World] War we had to rely to a very large extent for our manufactured drugs and mineral compounds on foreign chemists. They were far ahead of us Germany and America ... The result is that today the situation is entirely changed.'⁴⁵

The form of Williams' buildings neatly followed this new production process. The 'Wets' D10 is a prime example (Figure 3): here creams and medicines were manufactured on a ground floor naturally lit by an impressive central atrium, products stored in galleries above, while delivery and dispatch took place at opposite ends of the building.⁴⁶ A grid of mushroom columns supporting floors of flat slab concrete gave the building its strength. The manufacturing process for powders was a different process and so the form of Williams' second building, 'Drys' D6, offered an alternative solution. Again this was a four storey flat slab concrete construction but this time with Z beams suspended from the bulk of the structure creating an adjacent loading dock with a huge column free space. Concrete was the key component throughout – 100,000 tons of local Trent Valley gravels used in D10 alone – and with the engineering and architectural skills of Sir Owen Williams the results were highly acclaimed. In 1951 the historian Nikolaus Pevsner called this, 'a milestone in modern architecture and especially concrete architecture',⁴⁷

and by the 1970s Boots D10 was listed and considered the most impressive British industrial building of the interwar period.⁴⁸ Within the local press Williams was highly praised and he used the opportunity to advance the cause of concrete. This was the biggest championing of the material the city had witnessed. In a 1933 illustrated address to a Nottingham audience Williams was quoted in full:

"It is the only material with complete flexibility according exactly to the laws of elasticity. It is a material which will undoubtedly play a great part in solving the needs of man, and almost of directing the needs of man, the same as stone and bricks have directed in other periods. It is a material that will govern and almost control man, but on the other hand, man, through his understanding not allowing himself to be controlled by material, will find a harmony between his needs and the material."⁴⁹

Modernism wasn't mentioned but only alluded to: 'Those [concrete] shapes needed no clothing nor assistance from decoration, which was the art of covering up mistakes'. This was a victory lap for Williams: only seven years before he had set out this functionalist vision during an Art Workers Guild lecture.⁵⁰ The response from the spellbound Nottingham audience went even further than Williams' pragmatic approach. This 'Wonder Factory' offered solutions to contemporary social problems by elevating the worker and reducing hours of employment:

'Science therefore rather than architecture erected this new home for Boots.... Wasted Labour is extravagance, it wears out the worker, it increases the cost, its end is irritation and possible bankruptcy... It follows then, that a pleasant atmosphere is conducive to good work, and an organisation which reduces physical labour and the noise of mechanisation to a minimum achieves a less costly and increased output.'⁵¹

A 1934 Boots souvenir of a D10 factory visit re-iterated, 'The modern world denies that drudgery is blessed, the modern factory has abolished drudgery.'⁵² In the local press Lord Trent, the head of Boots, used this as an opportunity to promote 'concrete plans for using machinery to create more leisure',⁵³ with, 'a compulsory month's holiday' and calling for 'a Roosevelt plan to employ a million men'.⁵⁴ Boots had a vast in-house publicity machine awash with articles and photographs, and though the concrete wasn't fetishised its technological and social achievements were – for Boots' staff this new efficiency had brought about the five-day week with no cut in pay.⁵⁵



Figure 4. Bicycle shed and bomb shelter (D12), by Owen Williams, c.1939 (CAIS 3468; courtesy of The Alliance Boots Archive and Museum Collection).

In other parts of the Boots estate the firm's traditional approach would emerge more fully. In these instances the chosen architect was Boot's own engineer H. C. Jessop, whose early concrete buildings such as D1, D19 and the Turbine House are classically proportioned and less structurally adventurous than Williams' work. W.

H. Tanner's 1937-8 Dutch-style brick canteen (D31) is an exciting break from this previous approach, which impressively could seat 2,000 staff at one sitting and was selected over a Williams' design.⁵⁶ Nor was Williams commissioned to design any of Boots' nationwide shops, though they were continuing to expand in number. However, as the threat of another war loomed ever closer, Boots commissioned Williams to design six 'splinter proof bomb shelters' (D12) to accommodate bicycles and provide protection for 1500-2000 people (Figure 4).⁵⁷ The final result was the purest proto-Brutalism on site: entrenched hexagonal concrete cylinders that allow for a generous central gangway and overhead ventilation with slated benches. Although little discussed by the city or architectural historians, the firms publicity department presented these as a corner stone of their lauded air raid precautions.⁵⁸ For Boots it seems concrete was considered as industrial and utilitarian but not paternal or commercial.



Figure 5. The Viyella Garments Factory, under construction, built 1919 (DD1420/15; courtesy of Nottinghamshire County Council: Nottinghamshire Archives).

The interwar period for the textiles manufacturer William Hollins & Co was very similar to the Boots experience, benefiting from growing consumerism while embarking on an organisational re-structuring framed within new concrete buildings. By this time Hollins had established itself as a forerunner in readymade garments and branded fabrics with 'Viyella'.⁵⁹ This successful era was marked by the erection of a new garments factory: a reinforced concrete building with brick panels engineered by the Trussed Concrete Steel Company (Figure 5).⁶⁰ This was one of the last buildings by prominent local architect E. R. Sutton, who had a long experience in designing Jacobean brick buildings, though the essence of the structure is similar to the Truscon engineered Ford factory in Highland Park, Michigan, USA. Its allowances of light and space would have been more impressive than anything else in the city and yet there was little local publicity. It seems Hollins' reputation was hampered by the fluctuating nature of the fashion trade. The early 1920s were a period of recession and the family run nature of the business had come into question. Subsequently in 1924 the new Chairman of Directors, Ernest Jardine, was chosen as an example of economic diversification, meritocracy and business connections.⁶¹ By the end of the decade Hollins' economic recession was over and the *Evening Post* enthusiastically reported on a general meeting presided over by Jardine. This gives some indication of how the firm operated:

'At the conclusion of the meeting the shareholders adjourned to the showrooms to witness a display of the various garments manufactured by the company. These included dainty frocks of exclusive design, smoking costumes, maids' frocks, beach costumes, tennis frocks, and men's cricket flannels and shirts. Girls employed at the Castle Boulevard works were the mannequins, and W. Whysall and Larwood, Notts cricketers, also took part in the parade of sports wear.'⁶²

It is perhaps not surprising that Viyella House completed during Jardine's directorship, was built with the help of Trent Concrete, a company he initiated.⁶³ Technical expertise in flat slab construction was commissioned via the Indented Bar and Concrete Engineering Company, again an American firm which had previously employed Sir Owen Williams.⁶⁴ Built in 1933 Viyella House (Figure 6) came to embody an era of rationalisation, centralisation and new scientific approaches to management.⁶⁵ This was a concrete warehouse and showroom tacked on to the older 1919 Viyella Garments Factory. Unlike Boots there is a strong emphasis on the Art Deco style of the 1930s: the exterior was enlivened with slender cast concrete fins while interior furnishings were complete with Cherry Wood panelling. This was a building for the fashion industry and the reception hall, showroom, and management offices were designed to impress clients. It was therefore more akin to Owen Williams work for the Daily Express, rather than the functionalist logic of the D10 foyer.⁶⁶ But the essence of the structure was the same as D10: reinforced flat slab construction with mushroom columns and continuous curtain walling. Though local architect Frank Broadhead received a two page feature in the *Architectural Review*,⁶⁷ his achievements went hardly noticed in the local press. By the time the company was moving into its new premises, the Viyella story dominating the newspapers was again one of recession and a subsequent shareholder revolt.⁶⁸ This enterprising new building went against the grain of the narrative yet it actually enabled the further rationalisation necessary to see the company regain economic success by the end of the decade. By which time the press were once again reporting positively on the firm,⁶⁹ while international cricket players and politicians were given tours of the showroom.⁷⁰



Figure 6. William Hollins & Co, Viyella House, built 1933 (DD1420/30; courtesy of Nottinghamshire Archives).

In Boots and Hollins, Nottingham was clearly an exemplar in progressive concrete buildings during the interwar period, but why was this approach not continued in the city's other industrial constructions? In many respects Nottingham was a microcosm of British industry in general, with tensions between established traditions and the need to diversify. Unlike Boots and William Hollins, firms such as John Player's, Raleigh and Home Brewery did not experience major managerial changes. They were still essentially second-generation family run concerns with a pedigree of paternalism, civic honours and local government. They were successful and did not experience the same level of economic uncertainty: their business model was simpler than the complexities of pharmaceuticals or the capricious behaviour of fashion. Unlike interwar Boots they were hardly the product of a second industrial revolution. Nevertheless some notable uses of concrete arose, even if most developments were rendered in brick. John Player's had experienced enormous growth since pioneering pre-rolled cigarettes in the 1880s. Outside the usual port-side locations of the tobacco industry, Player's strength lay in its marketing, but in 1901 under threat from American competition, it federated with thirteen other British firms to form Imperial Tobacco. This was a powerful organisation that could almost control a national market while allowing member firms to retain their own identity. It was in this environment that John Dane Player inherited his father's company at the same time it was experiencing major growth. These factors were reflected in its building programme. Completed in 1939, the towering bonded tobacco warehouse represents Player's biggest leap into concrete

construction – a reinforced 'Mouchel system', by the Bristol building firm William Cowlin & Son.⁷¹ This was almost a direct reproduction of their previous work in Bristol: tobacco warehouses, seven storey blocks with six bays in a utilitarian, neo-classical style.⁷² Their Nottingham warehouses are an example of the federated Imperial Tobacco firm pooling its resources and experience, rather than local civic diversification. Unlike Viyella House, no local architect was employed but the Nottingham press were overwhelmingly positive. The Evening Post called it the 'last word in building design', complete with a photograph and specifications such as a 'total colossal floor space of 10½ acres' and explaining that 'hogsheads of leaf tobacco are whisked above to the storing rooms by electric hoists'.⁷³

When it came to their own publicity and cigarette cards, Player's preferred to sing the praises of another late 30s building: No3 Factory. Built to accommodate distribution, manufacture, storage, air conditioning, staff restaurant and air raid precautions, its use of concrete did not express these functions. The beaux arts plan, piano nobile and entablature suggest this overtly neo-classical structure would not be out of place in imperial Whitehall were it not for the materials. The 'multi-rough' red brick was a successful product of the prolific Nottingham Patent Brick Co, while 'Empire Stone' was a precast concrete manufactured in nearby Narborough, Leicestershire. More than any building it expressed how Player's wished to see itself: as the largest cigarette factory in the world, entrenched in British commercial aspirations and Midlands industrialism. Beyond the facade and publicity, original plans reveal floors of reinforced concrete supplied by Trent Concrete and constructed by William Woodsend builders, who advertised their concrete structural skills in the City Handbook in 1926. Despite these strong regional associations, the architect was Imperial Tobacco's chief engineer based in Bristol.⁷⁴ This is surprising given the similarities in style and materials to local architect T. C. Howitt's nearby industrial commissions. Raleigh Offices and Home Brewery reflected the same traditional aspirations but these were essentially brick buildings with hidden steel frames.⁷⁵ Howitt was more familiar with this material, indeed in a 1926 article he wrote how one of the advantages of Nottingham was its 'abundant supply of good ordinary building bricks'.⁷⁶ That supply was principally led by the Nottingham Patent Brick Co – a large company firmly at ease in the city's industrial establishment, sharing similar civic honours and Victorian origins.⁷⁷

Home Brewery was run by the Farr family whose connections with Nottingham industry could also be traced to the late nineteenth century. By the 1920s they were well known for their conservative politics, local philanthropy and horse breeding at Welbeck Manor. Their other industrial concern was Daybrook Laundry, which in the 1930s commissioned the city's most Corbusian building.⁷⁸ This was surprising given the pedigree of the clients and so it seems that like Boots, cleanliness and chemicals was best served by concrete and contemporary modernism. But appearances can be deceptive, original plans show a more prosaic design process throughout the decade: wash house, boiler rooms and loading bay built at separate intervals. Moreover, the shop and reception were actually built of brick and treated with cement render in order to give a concrete appearance.⁷⁹ This was hardly integrated functionalism or truth to materials. The local architects Eberlin & Partners typified the British pluralist approach to architectural style – they were equally at home mimicking Tudor pubs as they were with continental modernism. It was a similar confused situation with Home Brewery's Crown Inn. This seemingly concrete Art Deco pub was actually a brick structure covered by 'Snowcrete' stucco and cast stone decorations.⁸⁰ It was one of number of 1930s pubs designed by W. B. Starr and Hall where concrete was used to express comfort and style.⁸¹

This pluralist approach to materials and architectural styles was most endemic in the prolific number of cinemas built in Nottingham during the 1920s and 30s. Concrete was used but only as secondary material to brick: in order to give relief or emphasise expression, if not its structural possibilities. Forms followed the fashionable styles of Art Deco, 'Jazz Modern' or occasionally Dudok – Dutch craftsmanship appealing to local sensibilities. These were contextual buildings still offering a sense of modernity.⁸² In the local press cinema design was praised for its 'brickwork of the most modern type' and 'streamlined' forms, but this was often corrected with 'blending harmoniously with the surroundings', and 'without embarking on futuristic design'.⁸³ Strict modernists such as Leslie Martin considered such buildings as 'not only misguided efforts, but even a positive danger'.⁸⁴ Nevertheless, compared to Nottingham's older industries the cinema business was young, and as such it offered a variety of desired concrete forms that could express the imagery and fantasy of cinema.

Economically, concrete can be seen as a barometer of manufacturing progress and the expression of certain consumerist desires. Most of the big employers were comfortable within their own traditions and this bred a degree of complacency that was not present at Hollins or Boots. Here concrete meant economic diversification: Hollins catching up with fashion, Boots catching up with the second industrial revolution. The concrete achievements at Boots question our very understanding of British modernism and industrial complacency. It presents a pragmatic possibility for Britain in the interwar period: free of socialist theorising but with overtly socialist effects: elevating the worker and creating more leisure. Yet without the institutional strength of the Deutscher Werkbund or theoretical underpinning of the Bauhaus, that pragmatism easily fell back on tradition or pluralism. The traditional 'classical' structures either hid concrete from view or used it to represent stone – a cheap alternative for an old industrial mindset. The pluralist approach however, did show where there was a commercial desire for concrete. In these instances concrete meant cleanliness, efficiency, fashion and comfort.

3. Politics

Despite local architectural pluralism and modernist innovations, the buildings commissioned by the city's local government rarely took full advantage of concrete; the most direct involvement with the material was via their support for the Trent Navigation Company. Generally concrete took a back seat role against the more traditional

materials of Nottingham brick or Portland stone, expressing either the 'Garden City', or empirical classical style. There were political and cultural reasons for this. In many respects the local political situation mirrored the national: for the most part a Conservative government being pushed by a strong opposition – a Liberal party gradually succumbing to the rise of Labour.⁸⁵ Against a national background of high unemployment and empire this was hardly a suitable environment for progressive design. This situation was reflected in British architectural practice, dominated by commissions for empire, state, church, or local government. There was no Deutscher Werkbund offering a new dynamic. Despite the national reach of E. Vincent Harris, architectural careers could be regionally defined: Harry Fairhurst in Manchester, Percy Thomas in Cardiff and W. G. Davies in Sheffield.⁸⁶ In Nottingham it was T. C. Howitt, who had so successfully carved out a career in local government during the 1920s that he had created an equally successful private practice the following decade, achieving large scale commissions in Birmingham. The local authority work that set his career off included 6000 residential houses and a local government building with a civic square and shopping arcade.⁸⁷ The two city engineers – T. Wallis Gordon and R.M. Finch – would follow suit with equally classical styles and traditional materials. Despite these factors, concrete still made a contribution and was widely discussed: most visibly in housing, most notably in infrastructure, but rarely in civic or educational buildings.

In Nottingham the most political issue of the period was housing. Again this problem followed national trends but here the situation was more acute than most: slums and overcrowding exacerbated by poor supply and a long history of tight municipal boundaries.⁸⁸ The First World War amplified these problems, subsequently defeating the old political reticence over council housing. What began as a belated response to a chronic problem became a source of civic pride by the end of the 1930s. By this point Nottingham was considered among the largest and fastest builders of council housing in the country: dramatically cutting the housing waiting list by building 17,095 houses.⁸⁹ A key component of nearly every house was concrete, but for the most part this was hidden.

What was clearly visible were the 698 concrete houses at the Wollaton Hall estate built by the Corporation in 1926-7 as an attempt to speed up the building process and take on unemployed engineers.⁹⁰ These houses were both an example of the local political pact, and the first major local criticism of concrete. By the early 1920s a personal axis had developed between the two local party leaders – Bernard Wright (Conservative) and Herbert Bowles (Labour) – enabling the swift execution of capital projects. This was despite a degree of umbrage within their own parties: Labour agitated for direct labour, municipal housing and large scale slum clearance, while the Conservatives preferred precisely the opposite. In order to successfully chair this highly politicised housing committee, William Crane embodied the Wight-Bowles axis throughout the interwar period. As a councillor for a safe Tory ward and as a businessman in the building trade, Crane had the energy and foresight necessary. Given his commitment some Labour councillors were 'at a loss to understand why Mr Crane is in the Tory Party',⁹¹ but considering his preference for private builders and suburban development, he had strong conservative principles. At a time when any hesitation would undermine the sensitive political pact, the problems at Wollaton were overcome by Crane's own ingenuity and the architectural assistance of Howitt. Together they developed the 'Crane' composite house, a building system that was essentially concrete walls supported by a steel frame set within concrete foundations. These were spacious garden city style semi detached houses, painted white for a stucco effect and planned in a formal layout with existing trees retained. The speed of construction and occupation was a considerable success – an entire estate complete within two years – but it was also a failing. Half way through the development the Evening Post was reporting on a 'divided committee', 'sylvan beauty spoiled', and 'condemnation of the general public'. The concrete was to blame:

'Whatever line the Labour Party may take, several members of the party have made secret of their intense antipathy to the idea of building another five hundred of what one of them has irreverently dubbed 'Kaffir kraals.' Nor is this to be wondered at, seeing that only a year or two ago the leading members of the party were declaring that to offer a concrete house to a working man was an insult. The drab, dreary effect produced by the aggregation of a thousand dwellings, all cut to the same pattern, also runs counter to Labour ideals for brightening the lives of the workers.'⁹²

In time the fears that this was the next 'Narrow Marsh of Nottingham' would prove ridiculous,⁹³ the estate has had a comfortable history ever since and in 2010 was designated a conservation area.⁹⁴ Nevertheless, the experience was enough to hamper the development of concrete council houses within the city until after the Second World War. Within the housing committee the Crane house had been sullied and thereafter brick was the essential material. That aside, the experience did further the committee's confidence that it was a major house builder and could successfully tackle the housing crises. The 1920s were hesitant compared to the following decade when two-thirds of the Corporation's interwar total was built. By which point Howitt had left to pursue his private practice though the Corporation still followed his specifications: concrete foundations, a reinforced concrete ground floor, Trent gravel concrete footpaths and pre-cast steps.⁹⁵ Though much of this was hidden from view, the strength and water resistant benefits of concrete foundations over brick had been recognised in Corporation regulations since 1907.⁹⁶ It is generally considered by historians that the efforts of the housing committee did improve working class living standards,⁹⁷ and this was supported to an extent by the advances made in concrete.

The suburban expansion of Nottingham was made possible by two important aspects of its infrastructural development: slum clearance and road building. Both of these contentious schemes were enabled by the political pact and concrete in its most hidden form: as a foundation, support or cast stone. The largest concentration of slum clearance was in the immediate east and south of the city: Sneinton to Narrow Marsh. This densely populated residential area was replaced with municipal facilities that enabled the new suburban Nottingham. The first of

these, the city transport depot, was complete in 1926 followed with the nearby Huntingdon Street Bus Station in 1930.⁹⁸ This created a more expansive and centralised system, facilitating the change from trams to trolley buses and the extension of its fleet.⁹⁹ As City Engineer, T. Wallis Gordon designed a neo-classical structure of brick and cast stone with steel girders, the concrete both reinforced the building and gave the facade a more expensive appearance then was actually the case. This was the same idea behind the concrete dressings for the retail buildings along Hockley and the adjacent wholesale market of 1938 – a brick and steel townscape of pluralist styles; Dutch brick, Art Deco and neo-classical.

Concrete also gave the depot and bus station the solid expanse necessary for pneumatic tyres carrying heavy loads. This was the same principle behind the city's road development: asphalt concrete and tarmacadam.¹⁰⁰ The biggest road scheme was the city's four and half mile outer ring road – a dual carriageway complete in various stages throughout the interwar period – joining the new outer estates and the inner city's main arterial routes.¹⁰¹ Retiring in 1935,¹⁰² this was T. Wallis Gordon final scheme and in his farewell address he envisage the bigger picture: the necessity for extending the city's boundary further than it had been in 1931.¹⁰³ Numerous smaller road widening schemes were also completed throughout this period, not least a series of new bridges. Though most of these were brick and steel structures, at least two – Moor Bridge and Wilford Road – were fully supported by concrete piers and balustrades. Moor Bridge opened in 1939 and was described as 'a fine modern structure of reinforced concrete', which, 'embodies the latest principles in construction' because it could be jacked up should it be affected by mining subsidence.¹⁰⁴

Despite Trent Lane Depot depicted at the centre of the 1937 Corporation Handbook cover (Figure 2), very few of the city's civic gestures made use of concrete. The cover of the handbook reveals the civic preference for traditional materials and the neo-classical: surrounding the depot are the War Memorial, Council House and Trent Building – only the latter two featured concrete. The Council House and Old Market Square was the Corporation's biggest civic gesture, symbolic of the city's attempt to clean up the city's image after its boundary extension was rejected in 1920. This was a monumental remaking of the town centre, replacing the eighteenth century exchange, shambles and market with reception hall, chamber, arcade and civic square. Supporting this steel frame and Portland stone structure was a concrete foundation, however the concrete beneath market square hadn't set in time for its opening, thus preventing public access. It was a highly lauded building at the time but for some it was also a representation of inequality and self-aggrandisement.¹⁰⁵ As an in-house architect this was T. C. Howitt's first major commission since his housing work and the choice of architect reflected the city's approach to design.¹⁰⁶ Design costs could be kept to minimum, while ensuring a quality of design schooled in the tradition of the city. Howitt was trained by Albert Nelson Bromley and therefore belonged to one of the city's established architectural dynasties.¹⁰⁷

The other major civic gesture, the Trent Building and Highfields Park was a major extension of the city's university, and though principally a municipal organisation, this period of growth was largely supported by the benefaction of Jesse Boot. Following the successful sale of his company to the American United Drugs Co, this was Boot's gift to the city and the classical form and plan followed his preferences. His chosen architect was Percy Morley Horder and despite an overwhelming inclination for Portland and Darley stone, there are some notable concrete works.¹⁰⁸ The most visible were the concrete gas lamps crowned by the city's emblem in cast iron, which lined the new University Boulevard. Other features are less direct: a concrete footbridge at the lesser western entrance, a concrete lined cascade filled with stone and various reliefs of a boater, swan and musical instruments. Unsurprisingly for the local press, Highfields Park and the Trent Building was a 'Poem in Stone',¹⁰⁹ a source of civic pride which didn't hurt the public purse.

In summary, the city's local government did not wish to express itself in concrete; the interwar civic facelift was rendered in Portland stone, slums were cleared to make way for municipal facilities mimicking stone, while most of the corporation's new houses were built predominantly in red brick. Yet would the wider theme of British suburban expansion have been possible without the underlying concrete? Would the trolley buses have run as smoothly without the asphalt, would the housing have been as secure with brick foundations and would the political compromise have been possible? It is difficult to gauge, but it is safe to say that concrete helped suburbia expand on a scale that had not happened before. But suburbia and council housing were also a reaction to the desperate state of the city's Victorian slums and here concrete was the silent improver in working class standards of living. If in these circumstances, concrete was made visible – such as the Crane 'composite house' – the results were controversial, upsetting the reputation of the material and the political balance.

Conclusion

Concrete was very rarely a monstrosity for interwar Nottingham: it more often meant economic revitalisation, technological change, social improvement, cleanliness, efficiency, fashion and comfort. As a product of the landscape, the city's local government and business leaders made an important contribution to the formative years of this twentieth century material; the inland navigation clearing the path for a series of firms which would establish the region as second only to the Thames Valley in concrete production. In a climate of recession after the First World War, concrete represented a hope for the future that was readily expressed by the most innovative of the city's industries. So much in fact that Hollins and especially Boots question our understanding of British industrial complacency and present an exciting possibility for interwar architecture. However, there were limitations as to how far the city would go: local concrete had to compete with local brick, which was both in plentiful supply and firmly placed within an industrial establishment still cast in Edwardian sensibilities and materials. Commercially, concrete was used to express new business, the fantasy of cinema, the cleanliness of

laundry or the comfort of hostelry. Compared to these concrete achievements, the expression of local government appeared tame: here a delicate balance had to be played out between the power of conservative symbolism and the efficiency of social improvement. Concrete underlay a suburban expansion that successfully tackled the housing crises, but at the same time was denied outward expression in favour of more traditional materials. That the only notable criticism of concrete throughout the interwar period happened at the successful Wollaton Hall estate is both an example of the precarious nature of that political compromise but also the weakness of the 'concrete monstrosity' argument.

For the most part it seems Nottingham was fairly typical of most British cities, particularly when it came to civic architecture, garden city planning, industrial complacency and commercial pluralism. In these instances the construction and application of concrete was conservative, however the circumstances and identity of the city were still expressed; patronage, architects and materials were predominantly local. It might also be said that through the career of T.C. Howitt, the civic designs of Nottingham went on to influence other parts of the country, particularly Birmingham and Newport. Where Nottingham stands out more significantly is in the impact of Trent Valley concrete, the Trent Navigation scheme, Boots and Hollins. Both Nottingham's concrete manufacture and 'Highway to the Sea' became nationally significant and together deserve consideration alongside other major concrete producing regions. Such a study might only confirm what we already know: that when it came to the scale of production and technical achievement, Nottingham was subservient to developments in the Thames Valley and the principle concrete producing regions of France, Germany and the USA. The concrete achievements at D10 and Viyella House was supported by a plentiful local supply, though the engineering ability was often imported from elsewhere, particularly via the Indented Bar and Concrete Engineering Company, Truscon and Sir Owen Williams. Nevertheless, such buildings support the view that in interwar Nottingham there was opportunity for a progressive application of concrete. Not only does the Boots site warrant international comparison by way of its buildings but also the discourse that surrounded it; machinery being used to create a better society was also a familiar theme at the Bauhaus.

Figure Captions

1. Stoke Bardolph Lock and T. C. Howitt's Lock Keeper's 'Cottage', 1923 (Courtesy of Nottingham City Council and www.picturethepast.org.uk)
2. Trent Lane Depot positioned firmly at the centre of the 1935 City Handbook (92.52, The City of Nottingham Official Handbook (Nottingham, Nottingham Corporation, 1937), Courtesy of Nottinghamshire County Council: Nottinghamshire Archives)
3. D10 interior packing hall, c.1930s (CAIS 6531, Courtesy of The Alliance Boots Archive and Museum Collection)
4. Bike shed and bomb shelter (D12), by Owen Williams, c.1939 (CAIS 3468, Courtesy of The Alliance Boots Archive and Museum Collection)
5. The Viyella Garments Factory, under construction, built 1919 (DD1420/15, Courtesy of Nottinghamshire County Council: Nottinghamshire Archives)
6. William Hollins & Co, Viyella House, built 1933 (DD1420/30, Courtesy of Nottinghamshire Archives)

Endnotes

- ¹ Leicester is generally seen as the primary innovator but the friendly rivalry between the two cities in matters of local history can be read in J. Beckett, 'What future for the past in local history?'. *The East Midland Historian*, v.4, (1994), pp. 5-15.
- ² The Boots site is described as '...of seminal importance in the history of modern architecture in Britain', in S. Sennott, *Encyclopedia of Twentieth Century Architecture*, (Oxford, Taylor & Francis.), p. 155.
- ³ Particularly the local authority led Nottinghamshire Archives, and privately owned Boots Archive.
- ⁴ E. Harwood, *Nottingham: Pevsner City Guide* (London, Yale, 2008).
- ⁵ A. Forty, *Concrete and Culture* (London, Reaktion Books, 2012).
- ⁶ K. Bonacker, *Beton: ein Baustoff wird Schlagwort* (1996). C. Simonnet, *Le Béton, Histoire d'un Matériau* (Marseille, Editions Parenthèse, 2005). G. Delhumeau, *L'invention du Béton Armé: Hennebique, 1890-1914* (Paris, 1999).
- ⁷ R. Weston, *Materials, Form and Architecture* (London, Lawrence King, 2003).
- ⁸ K. C. Edwards, 'Nottingham and its Conurbation', in K. C. Edwards, ed., *Nottingham and its Region* (Nottingham, British Association for the Advancement of Science, 1966), pp. 448-456.
- ⁹ F. M. Taylor, 'Geology', in K. C. Edwards, ed., *Nottingham and its Region* (Nottingham, British Association for the Advancement of Science, 1966), pp. 11-40.
- ¹⁰ T. Cooper, *Laying the Foundations: A history and archaeology of the Trent Valley sand and gravel industry* (Oxford, Alden Press, 2008), p. 2.
- ¹¹ Cooper, *Laying the Foundations*, p. 1.
- ¹² Forty, *Concrete and Culture*, pp. 101-103.
- ¹³ Cooper, *Laying the Foundations*, p. 5.
- ¹⁴ J. Symonds and T. Cooper, 'Gravel extraction: history of the aggregates industry in the Trent Valley', in D. Bridgland, A. Howard, M. White, T. White eds., *Quaternary of the Trent* (Oxford & Oakville, Oxbow Books, 2014), p. 237
- ¹⁵ Cooper, *Laying the Foundations*, p. 32.
- ¹⁶ Cooper, *Laying the Foundations*, p. 42.
- ¹⁷ For an image see: Cooper, *Laying the Foundations*, p. 42.
- ¹⁸ A. Jaeggi, *Fagus: Industrial Culture from Werkbund to Bauhaus*, (New York, Princeton Architectural Press, 2000), p. 49-50.
- ¹⁹ Cooper, *Laying the Foundations*, p. 10,
- ²⁰ Nottingham Evening Post, *Trent Navigation Progress*, Tuesday 30 June 1931, p. 5.
- ²¹ Harwood, *Nottingham*, p. 171,
- ²² Nottingham Evening Post, *Trent Navigation*, Wednesday 03 April 1918, p. 3.
- ²³ Nottingham Evening Post, *Nottingham a Port*, Tuesday 18 May 1926, p. 6.
- ²⁴ Nottingham Evening Post, *Trent Navigation: Most Important Since Ship Canal*, Friday 13 January 1922, p. 5.
- ²⁵ W. A. Appleton, *Nottingham's Highway to the Sea* (Thos Forman & Son, Nottingham, 1926).
- ²⁶ Appleton, *Nottingham's Highway to the Sea*, p. 28.
- ²⁷ Nottingham Corporation, *The City of Nottingham Official Handbook* (Nottingham, 1937), pp. 46-50
- ²⁸ Nottingham Evening Post, *New Warehouse*, Monday 16 January 1933, p. 5.
- ²⁹ Nottingham Evening Post, *Trent Navigation*, Tuesday 21 March 1939, p. 7.
- ³⁰ Trent Navigation Committee, 1934, CACM/TRENT/4 (Nottinghamshire Archives)
- ³¹ Trent Lane Depot Elevations, 1930s, 01/32001, Ext Ref:143 (The Canal & River Trust Archives, Newark)
- ³² K. Williams, *Read all About it! A History of the British Newspaper*, (London, Routledge, 2000), p. viii.
- ³³ J. Curran and J. Seaton, *Power Without Responsibility: The Press and Broadcasting in Britain* (London, Routledge, 1997), p. 44.
- ³⁴ B. Bagihole, 'Merger and Monopoly in the Local Press: a case study from Nottingham'. *Bulletin of Local History East Midlands Region*, XIX, 1984, pp. 1-14.
- ³⁵ For early league position see Nottingham Evening Post, *Tomorrow's Football*, Friday 30th November 1923, p. 7; for semi final see Nottingham Evening Post, *Summer Time Sport*, Saturday 13th April 1935, p. 8; and league position Nottingham Evening Post, *Semi-Finalists at the City Ground*, Friday 08 March 1935, p.14.
- ³⁶ S. D. Chapman, 'Economy, Industry & Employment', in J. Beckett, ed., *A Centenary History of Nottingham* (Manchester, Phillimore, 2006), pp. 480-512.
- ³⁷ Nottingham Evening Post, *Developing the Colwick Site*, Saturday 07 January 1922, p. 1.
- ³⁸ Nottingham Evening Post, *The Royal Show at Nottingham*, Tuesday 10 July 1928, p. 5.
- ³⁹ Nottingham Evening Post, *More about Nottingham's New Industry*, Monday 05 March 1928, p. 5.
- ⁴⁰ Chapman, 'Economy, Industry & Employment', pp. 480-512.
- ⁴¹ P. Whysall, 'Interwar retail internationalization: Boots under American ownership'. *International Review of Retail, Distribution and Consumer Research* v.7, n.2, (1997), pp. 157-169.
- ⁴² Whysall, 'Interwar retail internationalization: Boots under American ownership', pp. 157-169.
- ⁴³ David Cottam, *Sir Owen Williams*, p.80.
- ⁴⁴ Harwood, *Nottingham*, pp. 214-216
- ⁴⁵ The Beacon, *Pharmaceutical Products: A broadcast talk by Lord Trent*, January-February, 1934 (The Alliance Boots Archive & Museum Collection).
- ⁴⁶ Cambridge Architectural Research Ltd, *Conservation Management Plan for the Boots 'Wets' Factory D10* (2008), p1-6.
- ⁴⁷ N. Pevsner, *Buildings of England: Nottinghamshire* (London, Penguin, 1951), p. 143.
- ⁴⁸ H. A. N. Brockman, *The British Architect in Industry 1841-1940* (Allen & Unwin, London, 1974), pp.169-70.
- ⁴⁹ Nottingham Evening Post, *Age of Reinforced Concrete*, Monday 23 October 1934, p. 5.
- ⁵⁰ D. Cottam et al, *Sir Owen Williams 1890-1969*, ed. Gavin Stamp, (London, Architectural Association, 1986), pp. 71.
- ⁵¹ C. Roberts, *Achievement: A Record of 50 years progress of Boots Pure Drug Co. 1888-1938* (Nottingham, Boots, 1938), p. 47.
- ⁵² *Souvenir of Boots Beeston Factory*, 1934 (The Alliance Boots Archive & Museum Collection).
- ⁵³ Nottingham Evening News, *Boots New Factory*, 28th July 1933, p. 1.
- ⁵⁴ Nottingham Evening Post, *Boots Wonder Factory* 27th July 1933, p. 7.
- ⁵⁵ Nottingham Evening Post, *Five Day Working Week*, Monday 19 November 1934, p. 8.

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- ⁵⁶ Works Planning Committee, 1937, A7/10, (The Alliance Boots Archive & Museum Collection).
- ⁵⁷ Bike Store Plan, DRG 448-5, 1937, (The Alliance Boots Archive & Museum Collection).
- ⁵⁸ The Beacon, August 1939, (The Alliance Boots Archive & Museum Collection), p. 113; 'A.R.P. in Industry'. The Chemist & Druggist, June 24, 1939, pp. 728-731.
- ⁵⁹ Chapman, 'Economy, Industry & Employment', pp. 480-512.
- ⁶⁰ Hollins & Co Castle Boulevard Factory, CA/PL/10383, 1919, (Nottinghamshire Archives).
- ⁶¹ F. A. Wells, *Hollins & Viyella: a study in business history* (David & Charles, Newton Abbot, 1968), p.134.
- ⁶² Nottingham Evening Post, *Record 'Viyella' Sales During 1927*, Thursday 22 March 1929, p. 6.
- ⁶³ S. Dawson, *Cast in Concrete: A guide to the design of precast concrete and reconstructed stone*, (Leicester, The Architectural Cladding Association, 2003), pp. 39-40.
- ⁶⁴ David Cottam et al, *Sir Owen Williams 1890-1969*, p. 80.
- ⁶⁵ S. Piggot, *Hollins: A Study of Industry 1784-1949*, (Nottingham, William Hollins & Co, 1949), p. 131.
- ⁶⁶ David Cottam et al, *Sir Owen Williams 1890-1969*, p.79.
- ⁶⁷ *The Architectural Review*, v.LXXXIV, n.442, September 1933, pp. 91-92.
- ⁶⁸ Nottingham Evening Post, *Angry Shareholders*, Thursday 19 April 1934, p. 12; F. A. Wells, *Hollins & Viyella*, pp. 203-215.
- ⁶⁹ Nottingham Evening Post, *Facing the Future with Confidence*, Friday 1 March 1940, p. 9.
- ⁷⁰ Nottingham Evening Post, *Cricketers Entertained*, Wednesday 19 July 1939, p. 9; Nottingham Evening Post, *South Australia to Nottingham*, Wednesday 4 June 1935, p. 5.
- ⁷¹ Harwood, *Nottingham*, p. 193.
- ⁷² These 1920s concrete warehouses were demolished in the 1980s, but the earlier brick buildings survive. See, A. Foyle, *Bristol: Pevsner City Guide* (London, Yale, 2004), p. 35-7, p. 273.
- ⁷³ Nottingham Evening Post, *Last Word in Building Design*, Friday 3 February 1939, p. 12.
- ⁷⁴ *Tobacco Factory*, CA/PL/2/14700, 1930, (Nottinghamshire Archives).
- ⁷⁵ *Raleigh Offices*, CA/PL/2/14586, 1929, (Nottinghamshire Archives); *Home Brewery New Offices*, DC/A/4/12/1/2905, 1938 (Nottinghamshire Archives).
- ⁷⁶ E. Button, ed., *Souvenir handbook : presented to the delegates attending the sixty-second Trades Union Congress held in the Albert Hall, Nottingham* (Nottingham, TUC, 1930), p.79.
- ⁷⁷ J. A. Sheard, *Clay Stealers to St Pancras Station* (Nottingham, Russell Press, 2011).
- ⁷⁸ A. P. Fawcett, 'A Tale of Two Cities: Sheffield and Nottingham – architecture and the provincial city in interwar Britain'. *Planning Perspectives*, 15 (2000), pp. 25-54.
- ⁷⁹ *Shop and Offices in Front of Daybrook Laundry*, DC/A/4/12/1/2136, 1932 (Nottinghamshire Archives).
- ⁸⁰ *Rebuilding of The Crown Inn*, CA/PL/16099, 1933 (Nottinghamshire Archives).
- ⁸¹ The others being The Lords Roberts, Broad St and The Vat and Fiddle, Queens Bridge Rd.
- ⁸² M. Janovich and L. Faire, *The Place of the Audience: Cultural Geographies of Film Consumption* (London, BFI, 2003), pp. 117-120.
- ⁸³ Nottingham Daily Guardian, 1 August, 1935; Nottingham Daily Guardian, 27 December, 1932, sourced from: M. Janovich and L. Faire, *The Place of the Audience*, pp. 117-120.
- ⁸⁴ L. Martin, ed., *Circle* (London, Faber and Faber, 1937), p.215, found in, Fawcett, 'A Tale of Two Cities', pp. 25-54.
- ⁸⁵ N. Hayes, 'The Government of the City, 1900-1974: The consensus ethos in local politics', in J. Beckett, ed., *A Centenary History of Nottingham* (Phillimore, Nottingham, 2006), pp. 463-479.
- ⁸⁶ Fawcett, 'A Tale of Two Cities', pp. 25-54.
- ⁸⁷ E. Scoffham, *A Vision of the City: The Architecture of T C Howitt*, (Nottingham, Nottinghamshire County Council, 1992).
- ⁸⁸ C. J. Thomas, 'Some Geographical Aspect of Council Housing in Nottingham'. *East Midland Geographer*, EMG 4, 26, (1966), pp. 88-98.
- ⁸⁹ R. Smith and P. Whysall, 'The origins and development of local authority housing in Nottingham 1890-1960', in S. Lowe and D. Hughes, eds., *A New Century of Social Housing* (Leicester, Leicester University Press, 1991), pp. 33-43.
- ⁹⁰ T. C. Howitt, *A Review of the Housing Schemes in Nottingham* (Nottingham, 1929), p. 72-84.
- ⁹¹ Nottingham Guardian, 7 February 1939, cited in, N. Hayes, 'The Government of the City', pp. 463-479.
- ⁹² Nottingham Evening Post, *The Crane Houses*, Thursday 30 December 1926, p. 5.
- ⁹³ Nottingham Evening Post, *Case Against Crane Houses*, Friday 31 December 1926, p. 6.
- ⁹⁴ A. Mulcahy, 'The Crane House'. *Nottingham Civic Society Newsletter*, n.146, (2011), pp. 22-23. M. Whitfield, 'Bungalowoid Modernism'. *The Modernist*, n.11, (2014), pp. 14-15. Nottingham City Council, *The Sutton Passes Conservation Area: Character Appraisal and Management Plan* (2011).
- ⁹⁵ Howitt, *A Review of the Housing Schemes*, p.109-120.
- ⁹⁶ Nottingham Evening Post, *The New Bye Laws*, Monday 03 May 1909, p. 5.
- ⁹⁷ Thomas, 'Some Geographical Aspect of Council Housing in Nottingham', pp. 88-98; Smith and Whysall, 'The origins and development of local authority housing in Nottingham 1890-1960', pp. 33-43.
- ⁹⁸ J. Giggs, 'Housing Population and Transport', in John Beckett, ed., *A Centenary History of Nottingham* (Manchester, Phillimore, 2006) pp. 435-462.
- ⁹⁹ Nottingham Evening Post, *New Tram Depot*, Tuesday 23 February 1926, p. 1.
- ¹⁰⁰ Nottingham Evening Post, *Council House Hustle*, Wednesday 02 September 1931, p. 6.
- ¹⁰¹ Giggs, 'Housing Population and Transport', pp. 435-462.
- ¹⁰² Nottingham Evening Post, *Presentation to Mr Gordon*, Saturday 27 July 1935, p. 5.
- ¹⁰³ Nottingham Evening Post, *City Engineer Honoured*, Wednesday 26 June 1935, p. 8.
- ¹⁰⁴ Nottingham Evening Post, *Nottingham's New Bridge*, Thursday 05 October 1939, p. 1.
- ¹⁰⁵ Janovich and Faire, *The Place of the Audience*, p. 101.
- ¹⁰⁶ Scoffham, *A Vision of the City*, p. 18.
- ¹⁰⁷ Harwood, *Nottingham*, p. 19.
- ¹⁰⁸ Nottingham City Council, *Highfields Park Management Plan* (Nottingham, 2013), p. 9.
- ¹⁰⁹ Nottingham Evening Post, *At Highfields*, Tuesday 10 July 1928, p. 8.